EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Jennifer McCallum on June 28, 2010.

The application has been amended as follows:

18. A competitive binding assay for detecting aneuploidy in a subject by simultaneously analyzing the relative frequency of all chromosomes in a sample from said subject, said method comprising:

(i) producing a sample from a subject comprising fluorescently-labeled sample polynucleotides that are representative of the number of each chromosome in said subject;

(ii) producing a standard comprising equivalent, non-aneuploid fluorescently-labeled standard polynucleotides for each chromosome, wherein the sample polynucleotides and the standard polynucleotides are labeled with fluorophores that have distinct emission spectra and the sample polynucleotides and standard polynucleotides are thereby distinguishable from one another;

(iii) mixing said sample and standard under hybridization conditions with a limiting amount of binding agents for each chromosome, wherein the binding agents comprise nucleic acids that are complementary to the sample polynucleotides and

standard polynucleotides for each chromosome and the nucleic acids are immobilized onto fluorescently-labeled microparticles,

wherein each binding agent for each chromosome comprises a different fluorescently-labeled microparticle that has a distinct size and fluorescent label intensity,

and wherein the fluorescent label on said microparticles has a distinct emission spectrum from that of the sample and standard; and

(iv) detecting hybridization of the sample polynucleotides and the standard polynucleotides to the binding agents by detecting the fluorescent signals emitted by the sample polynucleotides bound to the binding agents and the standard polynucleotides bound to the binding agents and by detecting and distinguishing between the microparticles of the binding agents for each chromosome based on the size and fluorescent intensity of the microparticles,

wherein the presence of aneuploidy in a subject is detected by detecting a difference in the fluorescent signal emitted by the sample polynucleotides bound to the binding agent as compared to that of the standard polynucleotides bound to the binding agent,

and wherein the identity of the binding agent bound to the sample and standard polynucleotides is determined based on the size and fluorescent intensity of the microparticle, thereby simultaneously analyzing the relative frequency of all chromosomes in a sample from said subject.

28. The assay according to claim 18, wherein said microparticles are silica microparticles.

Claims 27, 30-31 and 33 have been cancelled.

The following is an examiner's statement of reasons for allowance:

A. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April 12, 2010 has been entered.

B. The previous rejections of the claims under 35 USC 112, second paragraph and under 35 USC 103 have been obviated by the amendment to the claims.

C. The claims are allowable over the prior art for the following reasons:

The closest prior art of Pinkel (U.S. Patent No. 6,562,565; col. 2, lines 30-43; col. 3, lines 15-42) teaches a method of determining the copy number of chromosomal sequences (i.e., a method of detecting aneuploidy) comprising the steps of producing fluorescently-labeled test/sample nucleic acids from a subject (col. 3, lines 15-42, col. 10, lines 41-67); producing fluorescently-labeled polynucleotide reference/standard nucleic acids from a normal sample containing two copies of each autosomal sequence and having one or two copies of each sex chromosomal sequence depending on gender (i.e., non-aneuploid fluorescently-labeled polynucleotide standards) wherein the test/sample nucleic acids and the reference/standard nucleic acids are labeled with fluorophores having different emission spectra (col. 3, lines 22-27 and col. 10, lines 41-

67); mixing equal quantities of the test/sample nucleic acids and the reference/standard nucleic acids (col. 12, lines 28-38, col. 13, lines 41-50) with a limiting amount of "target nucleic acids" (i.e., nucleic acid binding agents) immobilized onto solid supports that are labeled with a fluorescent moiety; detecting the amount of binding between the test/sample nucleic acids and the binding agents and the amount of binding between the reference/standard nucleic acids and the binding agents, and comparing the amounts of binding wherein an increase in binding of the test/sample nucleic acids as compared to the reference/standard nucleic acids indicates an increase in copy number and a decrease in the binding of the test/sample nucleic acids as compared to the reference/standard nucleic acids indicates a decrease in copy number (i.e., wherein an unequal binding indicates aneuploidy; column 2, lines 66-67 and column 3, lines 1-6). In particular, Pinkel teaches that the nucleic acid binding agents may be on separate supports, such as a plurality of beads (column 2, lines 55-56), and that the target elements are typically from 1 uM to 3mM (i.e. microparticles, column 4, lines 26- 31 and col. 8, lines 59-61). Pinkel also teaches that beads of various sizes can be used (column 8, lines 57-61).

However, Pinkel does not teach or suggest labeling each probe with a different bead/microparticle so that the different probes can be distinguished from one another. The labeling of each probe with a different bead/microparticle that is distinguishable from other beads/microparticles based on its size and fluorescent emission permits the simultaneous analysis of all chromosomes for aneuploidy and permits one to identify the chromosome that is aneuploid and to distinguish the aneuploid chromosome from

the other chromosomes. Accordingly, the prior art does not teach or suggest the presently claimed competitive binding assays for detecting aneuploidy in a subject by simultaneously analyzing the relative frequency of all chromosomes in a sample from said subject.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carla Myers whose telephone number is 571-272-0747. The examiner can normally be reached on Monday-Thursday (6:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Nguyen can be reached on 571-272-0731. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Carla Myers/

Primary Examiner, Art Unit 1634